

*Either, both and neither in coordinate structures*¹

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Abstract

When the elements *either*, *both* and *neither* occur in a coordinate structure, they are usually analyzed as conjunctions. In this paper, it is argued that these elements are better analyzed as focus particles. The analysis of these so-called initial or correlative conjunctions as focus particles is motivated by their resemblance to focus particles with respect to (1) their distribution, (2) their interaction with sentential intonation, and (3) their contribution to the interpretation of the sentence.

1. Introduction

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In many studies of coordination, elements such as English *either*, *both* and *neither* are analyzed as conjunctions which precede the first conjunct (see, for example, Gazdar et al. 1985, Grootveld 1994, Larson 1985, Neijt 1979, Sag et al. 1985, Schwarz 1999). For this reason, coordination involving one of these elements is usually referred to as initial coordination. Other terms that are used to refer to this type of coordination are discontinuous coordination, correlative coordination and binary coordination. These terms relate to the observation that *both*, *either* and *neither* must cooccur with a particular conjunction: *both* with *and*, *either* with *or* and *neither* with *nor*. This is illustrated in (1).

- (1) Initial coordination:
 - a. both Pat and Kim
 - b. either Pat or Kim
 - c. neither Pat nor Kim

Although *both*, *either* and *neither* resemble coordinating conjunctions in that they usually precede a conjunct in a coordinate structure, it has been argued that *either* in (1b) cannot be a conjunction (Hendriks 2001, Johannessen 1998:154ff). The reason is that *either* can also occur displaced from the left edge of its conjunct, in contrast to true conjunctions such as *and*, *or* and *nor*. This is shown in (2), where *either* occurs to the left of this position, and in (3), where *either* occurs to the right of this position.

- (2) Jane either ate [the rice] or [the beans].
- (3) [Jane either ate the rice] or [she ate the beans].

This behavior of *either* remains unexplained under an analysis of *either* as a conjunction, because true conjunctions like *and*, *or* and *nor* are not allowed to occur displaced from the conjunct they introduce. While maintaining an analysis of *either* as a conjunction, Larson (1985) and Schwarz (1999) attempt to account for cases of left shifted *either* as in (2) through movement of *either* and deletion within the second conjunct, respectively. However, as is shown by Hendriks (2001), their analyses cannot be extended to account for cases of right shifted *either* like (3).

If it is assumed that *either* is a conjunction, also no explanation is provided for the observation that the distribution of *either* seems to be sensitive to the pattern of intonation of the sentence. This is illustrated by the following pair of sentences:

- (4) Either JANE will eat the rice or JOHN (will eat the rice).
- (5) * JANE will either eat the rice or JOHN (will eat the rice).

Here, capitals indicate contrastive stress. As these examples show, *either* must c-command the element in the first conjunct bearing contrastive stress,

i.e., *Jane*. If *either* does not c-command this element, as in (5), the result is unacceptable.

Hendriks (2001:136) suggests that these observations might be explained if *either* is a marker of contrastive focus. In this paper, this suggestion will be investigated in more detail. In particular, the properties of *either* will be compared to those of *both* and *neither*. If *either* in coordinate constructions is a focus particle, this is likely to be a property of initial conjunctions in general. Thus, *both* and *neither* might also be focus particles. This assumption will be tested by comparing *either*, *both* and *neither* to focus particles with respect to a number of properties. These properties include their distribution, their interaction with sentential intonation, and their contribution to the interpretation of the sentence. In section 2, we will look at *either*. Section 3 will be concerned with *both*, and section 4 will focus on *neither*.

2. *Either*

In this section, we will be concerned with the initial conjunction *either*. We will look at its distribution, the way it interacts with intonation, and its contribution to the interpretation of the sentence. The behavior of *either* with respect to these properties will be compared to the behavior of focus particles, such as *only*.

2.1 The distribution of 'either'

As was shown in the previous section, *either* is able to appear in other positions than the position preceding the first conjunct. In this respect, *either* displays a wider distribution than conjunctions such as *or*. The conjunction *or* is only allowed to appear in the position immediately preceding the conjunct it introduces.

With respect to its attachment possibilities, on the other hand, *either* shows a more limited distribution than *or*. As has been observed by Neijt (1979), *either* is not allowed to attach to lexical heads. Neijt (1979:3) illustrates this by the examples in (6)-(8). The a-examples below are unacceptable because *either* attaches to what seems to be a lexical head (N, A, and P, respectively) or perhaps some other non-maximal projection. In the b-examples, on the other hand, *either* attaches to a maximal projection (NP, AP, and PP, respectively). Because only attachment to a maximal projection is allowed, the b-examples are acceptable.

- (6) a. * a small either bus or car
b. either a small bus or a small car
- (7) a. * right either above or beneath that little chest
b. either right above that little chest or right beneath it
- (8) a. * very either red or blue

- b. either very red or very blue

Exactly the same pattern of acceptability can be observed with focus particles, such as *only*:

- (9) a. * a small only bus
- b. only a small bus
- (10) a. * right only above that little chest
- b. only right above that little chest
- (11) a. * very only red
- b. only very red

As is shown by the unacceptability of the a-examples in (9)-(11), the focus particle *only* is not allowed to attach to non-maximal projections either.

Thus, *either* resembles the focus particle *only* in the impossibility to attach to non-maximal projections. Interestingly, this restriction does not hold for simple, non-initial, conjunctions. Non-initial coordination is possible of maximal as well as non-maximal projections:

- (12) a. a small bus or car
- b. a small bus or a small car
- (13) a. right above or beneath that little chest
- b. right above that little chest or right beneath it

- (14) a. very red or blue
b. very red or very blue

In (12a), for example, *or* conjoins the noun heads *bus* and *car*. Note that, because non-initial conjunctions such as *or* are allowed to attach to noun heads, the unacceptability of (6a) cannot be explained on the grounds that nothing can ever intervene between an adjective and a noun except another adjective. If *either* in (6a) were a conjunction with the same distributional properties as *or*, *either* should be able to attach to a noun head and thus be able to intervene between an adjective and a noun.

Although this difference between the possibility of initial coordination and non-initial coordination, as illustrated by the difference in acceptability between (6a)-(8a) and (12a)-(14a), has been observed before, no satisfactory explanation has ever been given for this difference. Neijt (1979), for example, merely introduces an *ad hoc* restriction for non-initial coordination. Kayne (1994) assumes that only maximal projections can be conjoined. This explains why (6a)-(8a) are unacceptable. However, under this assumption the acceptability of apparent cases of head coordination such as (12a)-(14a) becomes problematic. Kayne is forced to assume that what looks like coordination of heads must in fact be derived from coordination of maximal projections. He takes the operation responsible for deriving head coordination from coordination of maximal projections to be

Right Node Raising. Under Kayne's analysis, the structure of (12a)-(14a) must be as follows:

- (15) [a small]₁ bus or [e]₁ car
- (16) [right above]₁ or [e]₁ beneath that little chest
- (17) [very]₁ red or [e]₁ blue

However, as Johannessen (1998:183-185) already points out, a problem with this analysis is the fact that Right Node Raising always requires the empty category to precede its licencer. In (15)-(17), in contrast, the empty category follows its licencer. Therefore, (12a)-(14a) cannot be derived from (12b)-(14b) through Right Node Raising. Hence, Kayne's analysis of coordination cannot account for the acceptability of (12a)-(14a). As a result, Kayne's analysis does not provide a satisfactory explanation for the difference in acceptability between initial and non-initial coordination of non-maximal projections.

The observed difference between initial coordination and non-initial coordination appears problematic for any theory of coordination which treats *either* as a conjunction. However, if *either* is analyzed as a focus particle, the difference in acceptability between (6a)-(8a) and (12a)-(14a) automatically follows from restrictions on the distribution of focus particles. Focus particles in general are not allowed to attach to non-maximal projections (cf. Bayer 1996). If *either* is a focus particle, it follows that it is

not allowed to attach to non-maximal projections. Hence, an explanation is provided for the difference in acceptability between (6a)-(8a) and (12a)-(14a). Note that *either* and *only* are not completely identical in their distribution. Whereas there do not seem to be any restrictions on the type of sentences that *only* can occur in, *either* in the above examples always cooccurs with *or*.

2.2 *The interaction of 'either' with intonation*

As was already mentioned in section 1, *either* must c-command the element in the first conjunct bearing contrastive stress. The relevant examples are repeated below:

(18) Either JANE will eat the rice or JOHN will eat the rice.

(19) * JANE will either eat the rice or JOHN will eat the rice.

If contrastive stress falls on the subject, *either* must c-command the subject. This is the case in (18). If *either* does not c-command the stressed subject, the result is an ill-formed sentence, as can be witnessed by the unacceptability of (19). The same kind of interaction with intonation seems to occur with the focus particle *only*. As is observed by Jackendoff (1972:247-254), *only* can associate with almost any focused phrase in the sentence as long as the particle c-commands the focused phrase.

(20) Only JANE will eat the rice.

(21) * JANE will only eat the rice.

So both *either* and *only* must have an intonationally prominent element in their c-command domain. If not, the sentence is unacceptable. In the case of *either*, this intonationally prominent element is the element in the first conjunct that is contrasted with an element in the second conjunct. Both contrasted elements carry contrastive focus. In the case of *only*, the required intonationally prominent element is the element in focus.

2.3 *Scope ambiguities with 'either'*

In the preceding two subsections, it was argued that *either* and *only* behave similarly with respect to their distribution as well as with respect to their interaction with intonation. The remainder of this section will be concerned with a comparison of the contribution of these two elements to the interpretation of the sentence. The discussion consists of two parts. First, we will look at the scopal properties of sentences with *either* and *only*. Next, we will look at the semantics of *either* and *only*.

It has been observed that sentences with *only* sometimes show scope ambiguities (Taglicht 1984:142-164). Thus, sentence (22) is ambiguous between a reading according to which they were advised not to learn any

other language, and a reading according to which they were not advised to learn any other language. The first reading arises if the scope of *only* is confined to the lower clause. The second reading arises when *only* has scope over the matrix clause.

(22) They were advised to learn only [_{NP} Spanish].

(23) They were only [_{VP} advised to learn Spanish].

Taglicht also observes that if *only* is shifted to the position preceding the matrix verb, this scope ambiguity disappears. Thus, (23) (i.e., Taglicht's example (73)) does not have the first reading but only has the second reading. Because the scope ambiguity is resolved if *only* is placed in front of a VP, a plausible assumption is that the ambiguity of (22) is a normal quantifier scope ambiguity, arising as a result of [only Spanish] being a quantified NP (cf. Rooth 1985, Krifka 1992). Thus, *only* does not seem to get wide scope on its own, but only when carried 'piggy-back' by expressions that can get wide scope, such as NPs. Because VPs are no scope taking expressions, (23) is not ambiguous.

Interestingly, similar scope ambiguities have also been observed with *either* in coordinate structures. According to Larson (1985), (24) is ambiguous. The disjunction can be interpreted inside or outside the scope of the intensional verb. According to the first reading, Mary is looking for a servant and would be satisfied with anyone who is a maid or a cook.

According to the second reading, Mary is looking for a maid or Mary is looking for a cook, but the speaker does not know which.

(24) Mary is looking for either [NP a maid or a cook].

(25) Mary is either [VP looking for a maid or a cook].

In sentence (25), on the other hand, the disjunction can only be interpreted outside the scope of the intensional verb. So the pattern of ambiguities with *either* seems to be similar to that with *only*. Indeed, the following sentences with *either* seem to show the same pattern of ambiguity as the sentences with *only* in (22) and (23):

(26) They were advised to learn either [NP Spanish or German].

(27) They were either [VP advised to learn Spanish or German].

Also here, ambiguity arises if *either* is placed in front of a NP conjunction. According to the first reading, the advise was to learn Spanish or to learn German. This reading is not available in (27). According to the second reading, the advise was to learn Spanish or the advise was to learn German. No ambiguity arises if *either* is placed in front of a VP conjunction. This sentence only has the latter reading for most speakers of English. These interpretations suggest that *either* behaves like a focus particle with respect to scope ambiguities.

2.4 *The contribution of 'either' to the interpretation of the sentence*

A second aspect of the interpretation of sentences with focus particles that we will look at here concerns the interaction of the focus particle with the focus in the sentence. König (1991) distinguishes three properties of the interaction of focus particles with their focus: (i) sentences with focus particles entail the corresponding sentence without particles, (ii) focus particles quantify over the set of alternatives introduced by focus, and (iii) focus particles may include or exclude these alternatives as possible values for the open proposition in their scope. Additive particles such as *also* and *too* include alternatives as possible values for a given open proposition. *Only*, on the other hand, is a restrictive particle: it excludes all alternatives. If the approach to focus proposed by Rooth (1985) is adopted, these alternatives are introduced by focus. According to Rooth, sentences do not only have an ordinary semantic value but also have a focus semantic value. The focus semantic value is obtained by substituting other possible values for the focused phrase. This can be illustrated by the following example, which is Rooth's example (21):

(28) John only SWIMS.

This sentence has the ordinary semantic interpretation that John swims.

Because *swims* is focused, this sentence introduces a set of alternatives. This set of alternatives is obtained by substituting other properties for *swims* in the proposition in (28). Thus, the focus semantic value of this proposition is the set of properties that are of the same semantic type as *swims*, for example the properties of running and of playing tennis. The property of swimming also is a member of this set. Because *only* excludes all other members from this set, the resulting interpretation is that John does nothing but swim. This focus-influenced component of meaning is given in (29).

The formula in (29) states that for all properties P that hold for John and that are a member of a certain set of properties C, it holds that this property P is identical to the property expressed by *swims*.²

$$(29) \quad \forall P [P(j) \ \& \ C(P) \rightarrow P = \text{swim}']$$

The set C is the set of contextually relevant properties. The restriction in (29) that P must be a member of the set of contextually relevant properties is important, since we do not want to claim that if John only swims, he does not have the property of being John or does not breath. Relevant properties

² Note that although the focus-influenced component of meaning in (29) is determined by the semantics of *only*, no focus particle needs to be present to trigger a set of alternatives. Focus alone already triggers such a set of alternatives, witness the interpretation of *John SWIMS*.

for (28) are, for example, exercise activities such as running and playing tennis, but not breathing and being John.

Now let us look at *either*. Sentence (30) clearly entails the sentence without *either*, which expresses the assertion that Jane ate the rice or that she ate the beans.

(30) Jane ate either the RICE or the BEANS.

If *either* is a focus particle, it should be possible to formulate a focus-influenced component of meaning similar to (29). Such a focus-influenced component of meaning might be as follows:

(31) $\forall x [\text{eat}'(j,x) \ \& \ C(x) \rightarrow x \in \{r,b\}]$

This formula states that for all things such that Jane ate them and such that they are in the set of contextually relevant objects, it holds that these things are members of the set that only contains the rice and the beans. Thus, according to the formula in (31) *either* excludes all alternatives introduced by focus as possible values for the open proposition. The only values that are possible are the two values introduced by the two conjuncts. The role of the conjunction *or* is to introduce the domain where the second value must be found.

Whether *either* indeed has a restrictive interpretation as in (31), or in other words, whether *either* is exhaustive in that it requires all possible values for the open proposition to be expressed explicitly by the disjunction, still is an open issue. According to Zimmermann (2000:267-8), the function of *either* indeed is to explicitly mark exhaustivity. Zimmermann points out that *either-or* disjunctions require closure intonation, unlike disjunctions without *either*. Because closure intonation indicates that the space of all possibilities has been covered, *either* must express exhaustivity. If Zimmermann is correct in his claim that *either* is exhaustive, this would yield another argument that *either* must be analyzed as a focus particle.

2.5 *Inclusive versus exclusive disjunction*

The issue of exhaustivity, as discussed in the previous subsection, must be distinguished from the issue of exclusivity. An exclusive disjunction is true if exactly one of the conjuncts is true, whereas an inclusive disjunction is true if at least one of the conjuncts is true. As is well-known, simple *or* disjunctions can be interpreted inclusively or exclusively, depending on context and world knowledge. The standard solution in semantics is to posit just one *or*, which has an inclusive meaning (see, e.g., Simons 2001). The exclusive interpretation is derived pragmatically through Gricean implicature. Someone who uses a disjunction apparently is not in a position

to claim that both conjuncts are true. Otherwise, the speaker would have used the stronger statement of a conjunction.

Relevant to the present discussion is the question whether *either* can force an exclusive interpretation onto the disjunction. An anonymous reviewer pointed out that *either* is used exactly to make it clear that exclusive disjunction is intended. The suggested treatment of *either* fails to capture this fact. However, McCawley (1981:230-1) argues that the exclusivity of the disjunction not only is an illusion in simple *or* disjunctions but also in *either-or* disjunctions. First of all, many supposed examples of exclusive disjunction are examples in which it is (logically or otherwise) impossible for more than one of the conjuncts to be true:

(32) Today is either Monday or Tuesday.

Only relevant for the present discussion are sentences in which it is possible for both conjuncts to be true but which nevertheless suggest that the two conjuncts are not both true. However, McCawley argues that the exclusive disjunction in these cases merely is an illusion. To illustrate this, he discusses the following example:

(33) On the \$1.50 lunch you get either a soup or a dessert.

According to McCawley, when one is offered a package deal, one is not normally required to accept all the items in the package. If the conjunction *and* were used, the hearer would not have been required to take both soup and a dessert. However, the hearer would have been entitled to do so. The offer in (33) entitles the hearer to take a soup and entitles the hearer to take a dessert. If the hearer were not entitled to these items, a linguistically simpler alternative such as *On the \$1.50 lunch you get a soup* would correctly express the offer. Similarly, the hearer is not entitled to take both because if the hearer were, the conjunction *and* would have been used. So the hearer is entitled to exactly as much as is consistent with the Gricean maxims of quantity, manner, and relevance. This example illustrates that we do not need to posit an exclusive disjunction to account for the relevant data. Following McCawley, I will therefore assume that *either* does not express exclusive disjunction. The proposed treatment of *either* correctly reflects this assumption.

Summarizing, in this section it was argued that *either* resembles *only* in several respects. First, *either* and *only* have a similar distribution, which cannot be explained under an analysis of *either* as a conjunction without making several additional assumptions. Secondly, *either* clearly shares the focus sensitivity of focus particles. And thirdly, *either* gives rise to similar scope ambiguities as *only* and might even interact with focus in a comparable way. In the remainder of this paper, we will investigate whether this resemblance to focus particles also holds for the initial conjunctions

both and *neither*. If so, then there is no need to distinguish initial coordination as a special kind of coordination. Rather, only one type of coordination exists, in which a focus particle may or may not appear in the part of the coordinate structure preceding the conjunction.

3. *Both*

In the previous section, several properties were discussed that are displayed by the element *either* as well as by the focus particle *only*. In this section, we will investigate whether these properties also hold for *both*.

3.1 *The distribution of 'both'*

At first sight, *both* appears to be a true conjunction, in contrast to *either*.

Larson (1985: 236-237) argues that *both* differs importantly from *either* in that it cannot be separated from the first conjunct by intervening material:

- (34) a. Mary is both [going to school] and [holding down a job].
- b. *? Mary both is [going to school] and [holding down a job].
- c. * Both Mary is [going to school] and [holding down a

job].

In the acceptable sentence (34a), *both* occurs in the position immediately preceding the first conjunct, as is expected if *both* were a conjunction. In (34b) and (34c), on the other hand, material intervenes between *both* and the first conjunct. These sentences are marginal at best or even completely unacceptable. This seems to confirm the view that *both* is a conjunction which cannot be separated from the coordinate structure by intervening material. However, Larson also provides the following sentence, in which *both* occurs inside the first conjunct:

- (35) [Mary is both going to the wedding] and [she is attending the reception afterwards].

This sentence is parallel to sentence (3) in section 1, where *either* occurs inside the first conjunct. Thus, *both* in principle seems to be able to occur in other positions than the position immediately preceding the first conjunct. This suggests that the unacceptability of *both* in the position preceding the auxiliary in (34b) and in sentence initial position in (34c) must have some other explanation. Indeed, *both* cannot appear in these positions, even if

these positions correspond to the position immediately preceding the first conjunct:³

- (36) a. *? Mary both [is going to the wedding] and [will be attending the reception afterwards].
- b. * Both [Mary is going to the wedding] and [she is attending the reception afterwards].

In these examples, *both* occurs in the position immediately preceding the first conjunct. Nevertheless, the two sentences are unacceptable. Thus, the unacceptability of (34b) and (34c) does not seem to follow from the status of *both* as a conjunction but appears to have some other reason.

That the distribution of *both* is comparable to, although not completely identical to, the distribution of *either* is supported by the following sentences (taken from the Selected Works of Edgar Allan Poe). These examples show that *both* can indeed occur separated from the first conjunct by intervening material:

³ An exception to this generalization are sentences like the following, where *both* precedes a conjoined subject:

- (i) Both [Mary and John] laughed.

Clearly, *both* occupies different structural positions in (i) and in (36b). In (i), *both* is attached to a NP, whereas in the unacceptable sentence (36b), *both* is attached to an IP. Apparently, attachment of *both* to IP is ruled out for some independent reason. Note that attachment of the focus particle *only* to IP is not possible either. *Either*, on the other hand, does allow attachment to IP. However, as is noted by Hoeksema and Zwarts (1991), there is considerable variation among focus adverbs along several dimensions, including their placement.

- (37) a. These circumstances proved fortunate both for
[myself] and [Augustus].
- b. There was (...) a remarkably thick and valuable carpet
covering the floor of both the [cabin] and
[staterooms].
- c. The windows, both of the [back] and [front] room,
were down and firmly fastened from within.

These examples show that *both* can appear to the left as well as to the right of the position preceding the first conjunct, just like *either*. In a number of cases, there even is some optionality with respect to the position of these elements. So the distribution of *both* and *either* is not strictly determined by the coordinate structure. This property is very hard to explain if these elements are analyzed as conjunctions occurring in a coordinate structure.

So *either* and *both* seem to share with focus particles their relatively free distribution. Also with respect to its attachment site, *both* shows the same restrictions as *either* and other focus particles. That is, *both* is not allowed to attach to non-maximal projections:

- (38) a. * a small both bus and car
- b. both a small bus and a small car
- (39) a. * right both above and beneath that little chest
- b. both right above that little chest and right beneath it

- (40) a. * very both red and blue
b. both very red and very blue

The unacceptable cases are all instances of attachment of *both* to a lexical head or other non-maximal projection. In the acceptable cases, *both* is attached to a maximal projection. If it is assumed that the element *both* occurring in coordinate structures is a focus particle, this restriction automatically follows, since focus particles attach to XPs only. On the other hand, if *both* were a conjunction here, additional assumptions would be necessary to explain the unacceptability of the a-examples, since simple, non-initial, coordination is possible of non-maximal projections. Therefore, the syntactic behavior of *both* strongly suggests that *both* is a focus particle.

3.2 *The interaction of 'both' with intonation*

In section 2.2, it was shown that *either* is sensitive to the pattern of intonation of the sentence. In this section, it will be investigated whether this is also true for *both*. At first sight, it might seem as if *both* is not subject to the requirement that it must c-command the element carrying contrastive focus. However, it will be argued that in cases where *both* does not c-command the contrasted element, *both* is not a focus particle but a floating quantifier.

Larson (1985) relates the fact that *either* can appear to the left of its standard position to certain scope ambiguities observed with disjunction. Crucial for his analysis is the assumption that *either* and *both* differ syntactically, since conjunctions do not display similar scope ambiguities. As an argument in favor of his claim that the apparently similar elements *either* and *both* have in fact a different syntactic status, Larson (1985:260) notes that *both* can occur in positions in which *either* cannot occur:

- (41) a. [John and Bill] both are going.
b. * [John or Bill] either is going.

Example (41a) seems to show that *both* is not subject to the c-command requirement that holds for *either* and *only*. According to this requirement, the focus particle must c-command the focused phrase that it associates with. However, in addition to their use in coordinate structures, elements such as *either* and *both* have other uses as well. *Either*, for example, can also occur if no disjunction is present in the sentence. In that case, *either* is used as a quantificational determiner, or as a suppletive form of *too* (see Rullmann to appear, for a discussion of this latter, sentence-final, use of *either*). Again, all examples are taken from the Selected Works of Edgar Allan Poe.

- (42) a. "I am quite ashamed to confess," I replied, "that I

have never even heard the names of either gentleman before".

- b. Had I not been a Scarabeus, therefore, I should have been without bowels and brains; and without either it is inconvenient to live.
- c. I will have none of their rabbit au-chat- and, for the matter of that, none of their cat-au-rabbit either.

In (42a), *either* is used as a quantificational determiner. In (42b), *either* can be analyzed as a quantificational determiner lacking its noun phrase complement, or as a bound pronoun. The use of *either* as a suppletive form of *too* occurring in negative contexts is illustrated in (42c). As is shown by the following examples, *both* can be used in a way that is parallel to the uses of *either* in (42a) and (42b):

- (43) a. The first action of my life was the taking hold of my nose with both hands.
- b. Presently he took from his coat pocket a wallet, placed the paper carefully in it, and deposited both in a writing-desk, which he locked.

In addition to its use in coordinate structures and as a quantificational determiner, *both* has a third use as a floating quantifier (Schwarzschild

1996). In this third use, *both* seems to be able to 'float' out of the subject NP into the VP. Other quantifiers that have this property are *all* and *each*.

Either, on the other hand, does not have this use as a floating quantifier.

Examples of floating *both* are given below:

- (44) a. Here are pistols; and we both know how to use them
when occasion demands their use.
- b. Contradictories cannot both be true.
- c. They were both then lying on the sacking of the
bedstead in the chamber where Mademoiselle L. was
found.

Now let us return to the sentences in (41) again. In (41a), which differs from (41b) in that *both* can occur at the right edge of the coordinate structure, whereas *either* cannot, *both* seems to be such a floating quantifier. As the examples in (44) show, this floating quantifier use of *both* is independent of the presence of a conjunction but merely requires a plural NP introducing exactly two entities. Thus, this different syntactic behavior of *both* as compared to *either* suggests that it has an entirely different use in these constructions. The element *both* which precedes the conjunction *and*, on the other hand, is subject to the same c-command condition that holds for *either* and the focus particle *only*:

(45) Jane will eat both the RICE and the BEANS.

(46) * JANE will eat both the rice and JOHN.

Because (45) is acceptable but (46) is not, *both* must be subject to the requirement that it c-commands the element in the first conjunct carrying contrastive stress. This yields support for the assumption that *both* in coordinate structures is a focus particle as well.

3.3 *The contribution of 'both' to the interpretation of the sentence*

Now let us turn to the interpretation of sentences with *both*. As we saw in section 2.3, *either* does not seem to be a scope bearing expression itself, but rather gives rise to scope ambiguities by being carried 'piggy-back' by an expression that can get wide scope. Because disjunction takes scope, ambiguity can arise when *either* is attached to a NP disjunction. Since conjunction does not take wide scope (Rooth & Partee 1982:357), *both* is predicted not to have any scopal effects. Thus, the following sentence is predicted not to be ambiguous:

(47) They were forbidden to take both [_{NP} a soup and a dessert].

The verb *forbid* is used here rather than the verb *advise* to be able to distinguish between the two possible readings more easily. Indeed, this

sentence appears not to express the wide scope reading that they were forbidden to take a soup and they were forbidden to take a dessert. Only the narrow scope reading seems to be possible, according to which they were allowed to take only a soup or only a dessert but could not take both. If *both* is a focus particle and does not take scope by itself, this is as expected.

The other aspect of the interpretation of sentences with *both* that we will be concerned with here is the way *both* interacts with the focus of the sentence. As was mentioned earlier, sentences with focus particles entail the corresponding sentence without the particle. Sentence (48) indeed entails the sentence without *both*, but only in one of its interpretations. According to this distributive reading, Jane ate the rice and she ate the beans.

(48) Jane ate both the rice and the beans.

(49) Jane ate the rice and the beans.

The other interpretation of (49), which is not available for (48), is a collective reading in which the two components of the meal might not be identifiable as separate substances anymore. We will return to the absence of a collective reading in coordinate structures with *both* in more detail in the next subsection.

According to König (1991), an important aspect of the interpretation of focus particles is that they quantify over a set of relevant alternatives. Focus particles include or exclude these alternatives as possible values for

the open proposition expressed by the sentence minus the focused phrase.

However, *both* does not seem to include or exclude alternative values for the focused phrase. If Jane ate both the rice and the beans, then the possibility is not excluded that she ate potatoes as well. Alternatively, if Jane ate both the rice and the beans, this does not imply that she must have eaten some other food too. At first sight, then, *both* seems to be neither additive nor restrictive in the sense of König. But if we look at the focus particles *too* and *also*, these elements behave similarly:

(50) Jane ate the rice and the beans too.

(51) Jane ate the rice and also the beans.

Too and *also* are additive focus particles. They express the requirement that, besides the focused phrase, at least one alternative value for the focused phrase satisfies the open proposition denoted by the rest of the sentence. If *too* and *also* occur in a coordinate structure, as in (50) and (51), not all alternative values for the focused phrase are implicit and have to be derived from the context. Rather, one alternative value is explicitly given. This is the value that is introduced by the other conjunct in the coordinate structure. For example, in (50), the additive focus particle *too* is attached to the focused phrase *the beans*. The alternative value for the denotation of *the beans* is explicitly given by the first conjunct of the coordinate structure, namely by the phrase *the rice*. No other alternative needs to satisfy the open

proposition denoted by the rest of the sentence. If *too* and *also* occur outside the context of a coordinate structure, all alternative values are implicit and must be derived from the context.

Since the focus particle *both* must always cooccur with a coordinate structure, the alternative value for the focused phrase in the syntactic domain of *both* will always be explicitly given by the second conjunct. This focus-influenced component of the interpretation of (48) will therefore be roughly as follows:

$$(52) \quad \exists x [\text{eat}'(j,x) \ \& \ C(x) \ \& \ (x \neq r)]$$

This formula expresses the additional conventional implicature that there is something else that Jane ate which is not the rice. Together with the asserted meaning that Jane ate the rice and the beans, this yields the ultimate interpretation of the sentence. Truth-functionally, therefore, coordinate structures with *both* do not differ from distributively interpreted coordinate structures without *both*, since the implicature is already contained in the assertion expressed by the sentence. However, this additional implicature might be responsible for the degraded acceptability of initial coordination of nearly synonymous expressions, such as *both kind and friendly*. Note that the distinction between what is the assertion part of the meaning and what is the conventional implicature part of the meaning is the other way around as with *either* and other restrictive focus particles. In the case of *only*, the

focus-influenced component yields the assertion part of the meaning, and the sentence without *only* yields the conventional implicature. This difference corresponds to the general asymmetry between the meaning of additive focus particles and restrictive focus particles (cf. König 1991).

So also with respect to its interaction with focus, *both* behaves like a focus particle. Whereas *either* resembles the restrictive focus particle *only*, *both* resembles the additive focus particles *too* and *also*. Also with respect to the other properties discussed, *both* resembles focus particles. For example, *both* was shown not to be able to attach to lexical heads, to be able to occur separated from the first conjunct of the coordinate structure, and to be sensitive to the pattern of intonation of the sentence. Under the assumption that *both* is a conjunction, these properties would remain unexplained. This suggests that *both* can best be analyzed as a focus particle, analogous to *either*.

3.4 *Collective versus distributive readings*

Before we turn to a discussion of the initial conjunction *neither*, we will briefly return to an issue that was left open in the previous discussion, namely the observation that coordinate structures without *both* allow for a collective reading, whereas this reading is impossible for coordinate structures with *both*. Because collective readings only occur with plurals, this issue does not arise for the two other elements under investigation,

either and *neither*. Coordinate structures which express a disjunction only have a distributive reading.

The presence or absence of a collective reading is often related to the occurrence of specific elements in the sentence. Certain predicates (e.g., *sneeze*) impose a distributive reading on their subject. Other predicates (e.g., *meet*) trigger a collective reading. A well-known observation is that *both* yields an unacceptable result if combined with a collective predicate:

(53) * Both John and Mary met.

Different explanations have been given for the lack of collective readings in coordinate structures with *both*. The standard semantic explanation is that NPs that give rise to a collective reading are of a different semantic type than NPs giving rise to a distributive reading. A syntactic explanation is put forward by Winter (1998), who argues that a collective reading only arises if a syntax-driven type shifting operation can apply to the NP coordination to derive a quantifier over plural individuals. A pragmatic explanation for the lack of collectivity in coordinate structures with *both* is proposed by Schwarzschild (1996). The hypothesis that distributivity is determined pragmatically explains why a distributive reading is possible but not obligatory with certain elements, such as the quantificational determiner *both* and the quantifier *both*. In contrast, initial coordination with *both* must always be read distributively. As Schwarzschild already points out, these

differences between the possible readings with *both* provide another argument for a distinction between different uses of *both*.

Under the proposed treatment of *both* as a focus particle, no additional assumptions have to be made to account for the obligatory distributive reading of coordinate structures with *both*. A distributive reading automatically follows from the interpretation of sentences with *both* as discussed in the previous subsection. In the case of the unacceptable example (53), the conventional implicature will involve the proposition that there is someone else than John who met. Because this proposition conflicts with the sortal restrictions of the collective predicate *meet*, (53) is correctly predicted to be unacceptable.

Additional evidence for the proposed treatment of *both* yields the observation that not only coordinate structures with *both* but also coordinate structures with other focus particles show a purely distributive behavior.

The a- and b-example below are taken from Winter (1998:28):

- (54) a. The Americans and the Russians too fought each other.
- b. The Americans as well as the Russians fought each other.
- c. The Americans and also the Russians fought each other.

These sentences carry the distributive meaning that the Americans fought each other and the Russians fought each other. No interpretation is possible according to which the Americans fought the Russians. Interestingly, these constructions all contain a focus particle or an element that can be used as a focus particle. The elements *too* in (54a) and *also* in (54c) are focus particles themselves. *As well* in (54b) is a focus particle when occurring in the same position as *too* in (54a). Apparently, focus particles always force a distributive reading. This distributive reading follows from Rooth's account of focus particles, which was also applied to the initial conjunction *both*. Therefore, the distributive reading forced by *both* yields another argument for *both* in coordinate structures being a focus particle.

4. *Neither*

In the previous section, it was concluded that *both* in coordinate structures behaves more or less similarly to *either* with respect to its distribution, its interaction with sentential intonation and its semantic correspondence to certain focus particles. Therefore, it was suggested that *both* should be analyzed as a focus particle too. In this section, we will investigate whether the same properties hold for *neither*.

4.1 *The distribution of 'neither'*

Like *either* and *both*, *neither* can appear in other positions than the position immediately preceding the first conjunct, as the following sentences from Edgar Allan Poe illustrate:

- (55) a. It was his custom, indeed, to speak calmly of his approaching dissolution, as of a matter neither to be [avoided] nor [regretted].
- b. Hearing the blow and the plunge of the body, the men below could now be induced to venture on deck neither by [threats] nor [promises].
- (56) a. If (...) it was found to come [under neither the category Aries (...)] nor [under the category Hog], why then the savans went no farther.
- b. [The gale had neither abated in the least], nor [were there any signs of its abating].

The examples in (55) show that intervening material can occur between *neither* and the first conjunct. In the examples in (56), *neither* occurs inside the first conjunct. The observation that *neither* can occur in the position at the left edge of the first conjunct as well as to the left and right of this position corresponds to the property of focus particles of being able to appear in several positions in the sentence.

Note that if the second conjunct is clausal, subject auxiliary inversion is required in this second conjunct, witness (56b). If *neither* occurs sentence initially while introducing a clausal conjunct, the first conjunct also undergoes inversion (*Neither had the gale abated ...*). Clausal conjunction thus reveals some syntactic differences between *either*, *both* and *neither*. Whereas *either* can attach to IP, *both* and *neither* are not able to attach to IP. *Both* must attach at a lower level (see footnote 3). *Neither*, on the other hand, may occur in a higher position, namely in the specifier position of the CP, as the inversion facts show. The possibility of *neither* and *nor* to occur in this position might be related to the negative feature they contain. However, we will not pursue this issue here, since it falls beyond the scope of this paper.

With respect to its attachment possibilities, *neither* resembles *either*, *both* and other focus particles. That is, *neither* is not allowed to attach to non-maximal projections:

- (57) a. * a small neither bus nor car
 b. neither a small bus nor a small car
- (58) a. * right neither above nor beneath that little chest
 b. neither right above that little chest nor right beneath it
- (59) a. * very neither red nor blue
 b. neither very red nor very blue

Again, simple, non-initial, coordination with *nor* is possible of lexical heads and other non-maximal projections. As was argued extensively in the discussion of *either* in section 2.1, this pattern suggests that *neither* is not a conjunction.

4.2 *The interaction of 'neither' with intonation*

Neither interacts with the intonation of the sentence in exactly the same way as *either* and *both* do. As the following sentences show, *neither* must c-command the phrase carrying contrastive focus:

(60) Neither will JANE eat the rice nor JOHN.

(61) * JANE neither will eat the rice nor JOHN.

This property of *neither* not only corresponds to the properties displayed by *either* and *both*, but also to the properties of focus particles in general.

As was the case with *either* and *both*, there are apparent exceptions to this c-command requirement:

- (62) a. It is not too much to say that neither of us believe in praeternatural events.
- b. (...) they effected their escape to their own country: for neither was seen again.

- c. Upon attempting to move from my position, I found that (...) I could not get up; neither could I move my right arm in any direction.

Again, these sentences are taken from the Selected Works of Edgar Allan Poe. In these cases, *neither* is not used as a focus particle, but has another use. In (62a), *neither* is used as a quantificational determiner. Here we can observe a difference between the quantificational determiners *either* and *neither*, on the one hand, and the quantificational determiner *both*, on the other. *Either* and *neither* combine with a singular noun or with an *of*-PP containing a plural noun phrase. *Both*, on the other hand, must combine with a plural noun or noun phrase directly. This difference is to be expected, given that the conjunction occurring with *both* expresses a plural, whereas the disjunction occurring with *either* and *neither* does not. In (62b), *neither* can be analyzed as a quantificational determiner lacking a noun phrase complement, or as a bound pronoun. In (62c), finally, *neither* is used as the negative variant of *also*, with the meaning 'also ... not'. In none of these uses, *neither* is required to c-command a focused phrase. However, if *neither* occurs with a coordinate structure, as in (60) and (61), it must c-command the contrasted element.

4.3 *The contribution of 'neither' to the interpretation of the sentence*

This subsection is concerned with the scopal properties of *neither* and its interaction with focus. Not surprisingly, perhaps, *neither* shows the same scope effects as *either*. This is illustrated by (63) and (64), which are parallel to (26) and (27) in section 2.3. Sentence (63) is ambiguous.

According to the first reading, the advise was not to learn Spanish and not to learn German. This reading is not available for (64). The second reading of (63) states that they were not advised to learn Spanish and they were not advised to learn German. This is also the reading expressed by sentence (64), which is not ambiguous.

(63) They were advised to learn neither [_{NP} Spanish nor German].

(64) They were neither [_{VP} advised to learn Spanish nor German].

The interpretation of these sentences can again be explained by assuming that *neither* is not a scope bearing expression itself, but gets wide scope through the ambiguity of the disjunction.

So *neither* resembles *either* with respect to the possibility of scope ambiguities. Now let us turn to the interaction of *neither* with focus. Does *neither* also resemble *either* with respect to its interaction with the focus in the sentence? The first impression is that this does not seem to be the case. Usually, sentences with *neither* entail the sentence without *neither* only if *neither* is replaced by negation. Thus, sentence (65) entails sentence (66):

(65) Jane ate neither the rice nor the beans.

(66) Jane didn't eat the rice nor the beans.

Sentence (66) contains an overt sentential negation. However, in certain cases no overt negation needs to be present, as is illustrated by the following examples, which are taken from the Selected Works of Edgar Allan Poe:

- (67) a. The instant that I left 'the devil's seat', however, the circular rift vanished; nor could I get a glimpse of it afterwards.
- b. I (...) heeded these things but little, nor spoke of them to Rowena.

Apparently, a negative implication is enough to satisfy the requirements of *nor*. In (67a), such a negative implication arises from the verb *vanished*. In (67b), it arises from the phrase *but little*. This suggests that the requirement of negation in the first conjunct is not a semantic requirement but rather a presupposition introduced by *nor*. This presupposition can be met by the element *neither*, but also by an overt sentential or phrasal negation or a negative implication.

Apart from this presupposition on negation, the interaction of *neither* with focus is similar to the interaction of *either* with focus. If *either* excludes all alternatives as possible values in the open proposition, *neither*

is the complement of *either*. It excludes the values introduced by the conjuncts as possible values in the open proposition. The focus-influenced part of the meaning of (65) then looks as follows:

$$(68) \quad \forall x [\text{eat}'(j,x) \ \& \ C(x) \rightarrow x \notin \{r,b\}]$$

This formula expresses the assertion that of all things eaten by Jane, the rice and the beans are excluded. Thus, the set of entities that are excluded by *neither* is the complement of the set of entities excluded by *either*.

Summarizing, in this section it was shown that *neither* does not behave like a conjunction. *Neither* can appear in other positions than the position immediately preceding the first conjunct, it cannot attach to non-maximal projections, it requires a focused phrase in its c-command domain, and it shows scope ambiguities which are similar to those displayed by focus particles. These properties cannot be explained if *neither* is a conjunction. If *neither* is a focus particle, on the other hand, these properties automatically follow.

5. *Conclusion*

In this paper, it was argued that the elements *either*, *both* and *neither* occurring in coordinate structures must be analyzed as focus particles, rather

than as conjunctions. These elements resemble focus particles with respect to their distribution, their interaction with the focus in the sentence, and their semantic properties. Whereas *either* and *neither* behave like restrictive focus particles, *both* behaves like an additive focus particle. In addition to their use as focus particles, *either*, *both* and *neither* also have other uses. These other uses are governed by other restrictions, and may have blurred the discussion of these elements in the literature.

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